

## LETTERS TO THE EDITOR.

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## The Perkin Jubilee and Chemical Industries.

At the meeting held at the Mansion House on February 26, with the Lord Mayor in the chair, many men of position and influence in the scientific world met to do honour to Dr. W. H. Perkin, and to agree to celebrate the jubilee of his discovery of the first coal-tar colour. Whilst all felt not only the importance, whether from a purely scientific or from an industrial point of view, of this discovery, and whilst they all applauded Perkin's researches in other branches of science and his modest and retiring bearing throughout, the fact could not be lost sight of that although England was the country in which the coal-tar industry was founded, it had practically, since those days, passed out of our hands into those of the Germans. The cause of this, I remarked, was not due to any want of knowledge or power on the part of Dr. Perkin himself, but rather to the absence of appreciation by capitalists and others engaged in industry of the importance of scientific method, or, in one word, to English Philistinism, the result being that the successful prosecution of a new industry the very existence of which depends on high scientific attainment was impossible. In corroboration of this opinion, which was also expressed in an excellent article in the *Times* a few days before the meeting, I ventured to direct attention to the fact that, being at that time (fifty years ago) engaged in building up a chemical school at Owens College, I knew three talented young German chemists whose names have since become watchwords in Germany (Caro, Martius, and Pauli) who were then employed in chemical works in Manchester and the neighbourhood. These men were intimately acquainted with the colour industry, both in theory and practice, so far as it had then advanced, and were perfectly capable, as was afterwards proved, of carrying it on successfully. Had they been supported by men of financial light and leading in Lancashire the industry might have flourished in this country. Not, however, finding the necessary support here, they returned to Germany, where they became the leading members of the great colour works at Ludwigshafen, Höchst, and Berlin.

But the Germans, not content with having secured an industry the value of which is reckoned at 50,000l. annually, are preparing for future attacks. On the very day of the Perkin meeting I received a letter from my friend Dr. Hagen, the director of the Physikalische Reichsanstalt in Charlottenburg, in which he informs me of the determination to found a corresponding Anstalt for chemistry, and in the last number of the *Berichte* I find a statement made by the committee of the German Chemical Society in support of this proposal. In this they point out, in the first place, that the due development of chemistry, influencing as it does so powerfully national life, cannot be ensured by individual effort, and that the establishment of a Reichsanstalt for chemistry is for this purpose necessary. In the second place, they proceed to indicate a large number of questions requiring solution which can only be satisfactorily answered by long-continued research. They conclude by the remark that such an institution must be of a national character, inasmuch as the subjects dealt with are of national importance, influencing the welfare and progress of the country.

Here we have a true trumpet call. Will England answer to it or will she otherwise make up her mind again to take a second place? In his admirable letter on "Science and the Industries" in the *Times* of Saturday, March 3, Prof. Silvanus Thompson points out that the electrical industry, and that of the manufacture of steel, are likely to fall, if they have not already fallen, into the hands of Germany and America, and insists, as many of us have been doing for the last twenty years, on the necessity of our commercial and educational leaders becoming aware of the absolutely vital nature of the bearing of scientific research on industrial prosperity. This conclusion is emphasised in a letter printed in the *Times* of March 6 from Sir Joseph Lawrence, in which he urges the plea that English

manufacturers are too poor and too closely run by competition to be able to afford scientific leading! This is indeed an appeal *ad misericordiam*!

The long and the short of it is that the Germans, and the Americans I may add, see this, and are strenuously working the principle into practice, whilst we remain "blind leading the blind." When will our eyes be opened?

HENRY E. ROSCOE.

## Cooperation between Scientific Libraries.

DR. BATHER'S letter in your issue of March 1 is one which deserves the hearty support of all scientific workers, in the United Kingdom at least. I have long felt that the whole of the literature indexed in the International Catalogue ought to be available for reference in some one locality, and preferably in London. In my address as president of the Chemical Society in 1894, foreshadowing the time when our meeting-room would be too small, I ventured to point out that "This is a difficulty that threatens to oppress all the Burlington House societies, and must become more pressing as the importance of bringing all societies having cognate aims into juxtaposition is realised. Perhaps some day our friends and neighbours the artists will have found quarters elsewhere more suited for the display of their works—for they appear already to have far outgrown the space at their disposal, and to be therefore obliged to impose undesirable limitations on exhibitors; when this occurs, it should be possible to find accommodation more adequate to the needs of science and fit presentment of its Imperial importance" (*Chem. Soc. Trans.*, 1894, 358).

Since then, the University of London has vacated the portion of Burlington House in which it long had its quarters, and the Royal Society has let slip a golden opportunity of securing these rooms for its own use, and at the same time of affording to other cognate societies—including the British Association—the increased accommodation they so much need. The quad. roofed in would make a magnificent reading-room. Sad experience teaches me that there is little hope in this country that those who are engaged in scientific work will consent to work together for some serious common purpose: apparently every little show must be run separately; but if they could be persuaded—if the Royal Society would for once have courage and lead—much might be done to further a project such as Dr. Bather advocates and bring it to a practical issue at no distant date.

HENRY E. ARMSTRONG.

THE letter of Dr. Bather on the above subject in *NATURE* of March 1 (p. 413) is of much interest.

My experience in the preparation of the Royal Society Catalogue of Scientific Papers fully confirms the statements of Dr. Bather and of Dr. Muir, to whose paper he refers, as to the inconveniences arising from want of coordination between different libraries.

When we were commencing the indexing of the scientific papers from 1884 to 1900, it was necessary to ascertain the names of new serials that had come into existence since 1883, and also to take note of the serials that had been omitted from the twelve volumes of the Catalogue already published. Members of our staff were sent to some of the scientific libraries in London, and a list was thus obtained containing more than 1400 serials of various degrees of importance. Many of these were, of course, unsuitable for our purpose; a large number, however, were incomplete, single volumes and sometimes single parts only being available. These separate portions had probably come to the various libraries as specimens, or for the purpose of obtaining exchanges; and if there had been a general agreement between the libraries of London, arrangements might have been made to maintain such serials complete in one or other of the libraries. If a joint hand-list, as suggested by Dr. Bather, had been in existence, much time expended by us in searching for these serials would have been saved.

A few days ago I heard that the Royal Society of Edinburgh is engaged in considering a scheme of cooperation amongst the principal scientific libraries of Edinburgh and Glasgow, and that a complete list of scientific serials in these libraries is to be compiled. It would be of great advantage if a similar scheme could be carried out in

London. In the libraries of the learned societies at Burlington House alone there are many serials in duplicate; some of these might profitably be replaced by others which are not at present in these libraries. It often happens that books and serials are sent to library committees on approval, and are rejected because they are thought to be more suitable for other libraries; but attempts are not always made to ascertain whether these other libraries possess them. At the present time, from want of space and other causes, the duplication of periodicals at Burlington House is avoided as much as possible.

In the subject index to the scientific literature of the last century which the Royal Society is preparing, it is proposed to indicate, in the introductory list of serials, the libraries in which the cataloguing has been done, and also to mention other libraries in which the books may be found. This will be useful to workers, but it cannot be quite complete, for the task would be too great to undertake in its entirety. For example, there are more than 600 serials which contain mathematical papers, and it would be impossible to name all the libraries where they are found.

March 3

HERBERT MCLEOD.

### The Bees of Australia.

Up to the beginning of 1905, 224 species of wild bees had been recorded from Australia, no less than 183 of them having been described by F. Smith, of the British Museum. I had the opportunity in 1904 to study Smith's types at the British Museum, and since then I have worked up the unnamed Australian material belonging to that institution, with the exception of some species of *Halictus* yet to be examined. The following list shows the genera found in Australia (including Tasmania, New Zealand, and the Austro-Malay Islands (taking the region as defined by Wallace), and the number of species in each.

Family.	Genus.	Australia.	New Zealand.	Austro-Malay Islands
Colletidæ	<i>Phenacolletes</i> *	1	—	—
	<i>Paracolletes</i> (sens. lat.)	52	8	—
	<i>Anthoglossa</i> *	4	—	—
	<i>Cladocerapis</i> *	1	—	—
	<i>Andrenopsis</i> *	1	—	—
Prosopidæ	<i>Hylæoides</i> *	2	—	—
	<i>Callomelitta</i> *	1	—	—
	n.g. aff. <i>Callomelitta</i> *	1	—	—
	<i>Prosopistemon</i> *	1	—	—
	<i>Euryglossa</i> *	29	—	—
	<i>Prosopis</i>	54	7	6
Andrenidæ	<i>Stilpnosoma</i> *	2	—	—
	<i>Sphecodes</i>	1	—	1
	<i>Halictus</i>	22	3	1
	<i>Parasphæcodes</i> *	18	—	—
	<i>Nomioides</i>	1	—	—
	<i>Meroglossa</i> *	1	—	—
	<i>Nomia</i>	19	—	21
	<i>Stenotritus</i> *	2	—	—
	<i>Andrena</i> ?	3	—	—
	<i>Gastropsis</i> *	2	—	—
Family ?				
Panurgidæ	<i>Scapter</i> ?	2	—	—
Ceratinidæ	<i>Ceratina</i>	—	—	6
	<i>Exoneura</i>	5	—	—
	<i>Allodape</i>	3	—	1
Xylocopidæ	<i>Xylocopa</i>	2	—	27
	<i>Lestis</i> *	2	—	—
Anthophoridæ	<i>Anthophora</i>	1	—	6
	<i>Saropoda</i>	2	—	1
	<i>Tetralonia</i>	1	—	—
	<i>Crocisa</i>	8	—	7
Melectidæ	<i>Nomada</i>	—	—	2
Nomadidæ	<i>Megachile</i>	50	—	57
Megachilidæ	<i>Lithurgus</i>	4	—	—
	<i>Thaumatostoma</i>	1	—	—
	<i>Ctenoplectra</i>	—	—	1
	<i>Coelioxys</i>	2	—	4
	<i>Parevaspis</i>	—	—	1
	<i>Anthidium</i>	—	—	1
	<i>Apis</i>	(1 introd.)	—	3
Apidæ	<i>Trigona</i>	5	—	7
		—	—	—
		317	18	153

The list proceeds from the most primitive bees up to the most specialised. The genera marked with an asterisk are wholly peculiar to Australia, so far as known; and it will be observed that, as with the mammals, there are many endemic genera of a primitive type. *Lestis* is the only endemic genus allied to the ordinary long-tongued bees, and that consists of two closely allied species, which represent an offshoot from *Xylocopa*, probably not of very ancient date. True *Xylocopa*, it will be noticed, just enters Australia (but one species is common in the north), but is rich in species in the Austro-Malay Islands, and extends into Asia, Europe, Africa, and America. The *Xylocopas* are the large carpenter bees, which nest in wood, and may be transported across the water in floating trees. Until recently, the genera *Thaumatostoma* and *Exoneura* were supposed to be peculiar to Australia, but the first has now been found in Burma and the second in Syria. They may possibly be genera which are verging on extinction, but as each differs only in one important particular from its nearest ally (these allies being *Megachile* and *Allodape* respectively), it is not impossible that they arose by parallel mutations in the widely distant localities in which they occur, quite independently.

The most interesting of the primitive genera is *Phenacolletes*, based on a new species (*P. mimus*) discovered by Commander J. J. Walker on the *Penguin Expedition*. The Colletid bees are supposed to have been derived from the fossorial wasps, and *Phenacolletes* is so like certain wasps that I was not sure whether it was a wasp or a bee until I had examined its pubescence with a compound microscope. Unfortunately, we know nothing of the habits of this insect, but Commander Walker kindly informs me that it was taken on November 12, 1890, at Turtle Bay, north end of Dirk Hartog Island. He finds in his journal for that day that "an upright growing shrub with ovate glabrous leaves and large whitish-rosy mallow-like flowers" was the only plant which seemed to be at all attractive to insects, so perhaps the *Phenacolletes* came off that.

I have supposed that the bees with emarginate tongues (Colletids and Prosopids) arose from the wasps independently from those with pointed tongues, this seeming the more likely, because the wasps themselves exhibit both types. However, there are indications that in Australia the first form may have become modified into the second within the limits of the bee-group. This is especially suggested by the tongue of *Callomelitta*, and by one of the new species placed for the present in *Paracolletes*.

The new genus allied to *Callomelitta*, indicated in the table, is for *Sphecodes antipodes*, Smith. Colonel Bingham very kindly made a critical examination of this species at my request, and found that it was not a *Sphecodes*, but belonged to a new genus differing from *Callomelitta* in the shape of the thorax, pubescence of hind tibiae, &c. It will undoubtedly prove an important form from the standpoint of the evolutionist.

The species marked as *Andrena*? and *Scapter*? stand in our lists as members of these northern genera, but they have not been critically examined recently, and it is questionable whether they are rightly classified. The name *Mellitidia* has been applied to the so-called *Andrena* of Australia, and it is probably valid. Nevertheless, there are some undoubted cases of well known northern genera having endemic Australian species, while they have none, so far as known, in the Austro-Malay region. These are *Nomioides* (found from Burma to Europe) and *Tetralonia* (India to Europe, &c.); *Saropoda* (also European) is really in the same category, as the single Austro-Malay species is one of the Australian ones, which has reached the Aru Islands. The case of the *Tetralonia* seemed a little doubtful, but Colonel Bingham has critically examined Smith's type, and reports that it is a true *Tetralonia*, but is a female, not a male, as Smith had it. *Lithurgus* is also a genus of Europe and Asia, and likewise Africa, which has Australian species, though none are known from the Austro-Malay islands. In this case, it is practically certain that the genus is dispersed more or less through the islands, and has been overlooked, for one of the Australian species is exceedingly close to one of India.

*Gastropsis*, placed by Ashmead in the *Andrenidæ*, is apparently allied to the European *Meliturga*, and is in a